

What is claimed is:

1. A filtration system comprising:
a chamber that includes a hydraulic loading area divided into a plurality of cells with smaller hydraulic loading areas; and
filter media positioned in each of the cells to filter water passing through the cells.
2. The filtration system of claim 1 wherein the water is unable to flow between cells as the water passes through the microbeads.
3. The filtration system of claim 1 wherein the filter media is spherical microbeads with diameters between 1mm and 3mm.
4. The filtration system of claim 3 wherein the microbeads have a density that is between 8 kg/cubic meter and 48 kg/cubic meter.
5. The filtration system of claim 1 wherein the microbeads within each cell have a depth between 15 cm and 60 cm.
6. The filtration system of claim 1 wherein the chamber has a rectangularly-shaped hydraulic loading area as water passes through the filter media and each cell has a square-shaped hydraulic loading area.
7. The filtration system of claim 1 wherein each cell has a hydraulic loading area less than 2.3 square meters.

8. A filtration system comprising:
a chamber that includes a hydraulic loading area divided into a plurality of cells such that each cell has a hydraulic loading area less than 2.3 square meters; and
microbeads positioned in each cell to filter water passing through the chamber, the microbeads being spherical and having diameters between 1mm and 3mm.
9. The filtration system of claim 8 further comprising a plurality of nozzles positioned above the filter media within the chamber to supply water to each cell in the chamber.
10. The filtration system of claim 8 wherein the microbeads have a density that is between 8 kg/cubic meter and 48 kg/cubic meter and the microbeads within each cell have a depth that is between 15 cm and 60 cm.
11. The filtration system of claim 8 wherein the hydraulic loading area of the chamber is rectangularly-shaped and the hydraulic loading area of each cell is square-shaped.
12. The filtration system of claim 8 further comprising a receiving tank to receive water from the chamber.
13. The filtration system of claim 12 wherein the chamber is at least partially immersed in the receiving tank.
14. The filtration system of claim 8 wherein the water in each cell is isolated from the water in the other cells as the water flows through the microbeads.

15. A filtration system for use in a water recirculating system, the filtration system comprising:

a chamber that includes a hydraulic loading area divided into a plurality of cells such that each cell has a hydraulic loading area less than 2.3 square meters;

microbeads positioned in each cell to filter water passing through the chamber, the microbeads being spherical and having diameters between 1 mm and 3 mm, wherein the microbeads have a density that is between 8 kg/cubic meter and 48 kg/cubic meter and the microbeads within each cell have a depth between 15 cm and 60 cm;

a plurality of nozzles positioned above the microbeads within the chamber to supply contaminated water to each cell in the chamber; and

a receiving tank for holding filtered water received from the chamber, the chamber being at least partially immersed in the receiving tank.

16. The filtration system of claim 15 wherein the water in each cell is isolated from the water in the other cells as the water flows through the microbeads.

17. The filtration system of claim 15 further comprising an air passage positioned above the filter media to pass air by the water to strip carbon dioxide from the water.

18. The filtration system of claim 15 wherein the microbeads are polystyrene.

19. The filtration system of claim 15 wherein the chamber includes 8 cells.

20. The filtration system of claim 15 wherein each cell has a perimeter greater than 6 meters.

21. The filtration system of claim 15 wherein the chamber has a hydraulic loading area greater than 4.6 square meters at a location where water passes through the filter media.
22. A water recirculating system for use in producing fish comprising:
a fish raising tank for holding water that provides an environment for fish to grow;
a supply system to deliver contaminated water from the fish raising tank;
a filtration system that includes a chamber with a hydraulic loading area that is divided into a plurality of cells with smaller hydraulic loading areas and filter media positioned in each cell to filter water received from the supply system; and
a delivery system that transports filtered water from the filtration system back to the fish raising tank.
23. The water recirculating system of claim 22 wherein the filtration system includes a plurality of nozzles positioned above the filter media within the chamber to supply contaminated water to each cell in the chamber.
24. The water recirculating system of claim 22 wherein the filtration system includes a receiving tank for storing filtered water received from the chamber, the chamber being at least partially immersed in the receiving tank.
25. The water recirculating system of claim 22 wherein the hydraulic loading area in each cell is isolated from the hydraulic loading area in the other cells such that water does not flow through filter media in more than one cell.
26. The water recirculating system of claim 22 wherein the filter media is spherical microbeads with a diameter between 1mm and 3mm and a density that is between 8 kg/cubic meter and 48 kg/cubic meter, the microbeads within each cell having a depth between 15 cm and 60 cm.

27. The water recirculating system of claim 22 wherein each cell has a hydraulic loading area less than 2.3 square meters.
28. The water recirculating system of claim 22 wherein the delivery system that transports filtered water from the filtration system to the fish raising tank is a pumping system.
29. The water recirculating system of claim 22 wherein the fish raising tank is a pond.
30. A method of recirculating water for use in a fish raising tank, the method comprising:
delivering contaminated water from the fish raising tank to a filtration system that includes a chamber with a hydraulic loading area that is divided into a plurality of cells with smaller hydraulic loading areas;
filtering the contaminated water using filter media positioned in each cell to produce filtered water; and
delivering filtered water from the filtration system back to the fish raising tank.
31. The method of claim 30 wherein filtering the contaminated water using filter media includes filtering the contaminated water using spherical microbeads with diameters between 1mm and 3mm and a density between 8 kg/cubic meter and 48 kg/cubic meter.
32. The method of claim 30 wherein delivering contaminated water from the fish raising tank includes delivering contaminated water to a plurality of nozzles positioned above the filter media within the chamber and uniformly dispersing the contaminated water over the filter media.

33. The method of claim 30 further comprising stripping carbon dioxide from the contaminated water.
34. The method of claim 30 wherein filtering the contaminated water using filter media includes supplying heterotrophic bacteria living on the filter media with fine organic solids in the contaminated water resulting in water polishing.
35. A method of improving capacity in a filtration system that includes microbeads floating in chamber, the method comprising dividing a hydraulic loading area of the chamber into cells with hydraulic loading areas that are smaller than the hydraulic loading area of the chamber.
36. The method of claim 34 wherein dividing the hydraulic loading area of the chamber into cells includes dividing the hydraulic loading area of the chamber such that water does not flow through microbeads in more than one cell.